Medication Adherence in Chronically Ill Veterans: Copayments, Other Potential Barriers, and Health System Factors to Potentially Mitigate Cost Burdens

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Medication Adherence in Schizophrenia: Impact of Copayments

Introduction

- 40-50% of patients with serious mental illness (SMI) are poorly adherent

- Severe ramifications & costs (symptom exacerbation, ↑ risk of ER, re-admissions, treatment $$)

- Widespread issue: Medicaid, managed care, Medicare, VA, other health systems

- Intriguing measurement or definition issues
Figure 1: from Valenstein et al., *Schizophrenia Bulletin* (2004), 30(2): 255-64
Adherence and Rate of Psychiatric Admission

Figure 2: from Valenstein et al., Medical Care (2002), 40(8):630-9
Study Background

- Rising pharmacy costs (national & VA)
- Medication restriction due to cost
- Numerous other risk factors (aside from cost)
- Variety of medication copayment plans
- 17-second history of VA copayments
  - $2 in 1990 → $7 in 2002 (now $8 or $9)
Effect of Copayments on Utilization

(hint: mostly negative)

- Health Services Utilization (outpatient, hospital, ER)
  - RAND, Group Health (psychiatric), others

- Pharmacy Utilization (many studies – few targeting mental health: see Soumerai et al.)
  - reduced utilization
  - differential effects of copays / cost-sharing
    - ethnicity, elderly, sicker patients, lower SES
Study Design & Exclusions

Period 0

Period 1

Period 2

Period 3

Period 4

Copay increase
February 1, 2002

6 – 1 – 99 6 – 1 – 00 4 – 1 – 01 2 – 1 – 02 12 – 1 – 02 9 – 30 – 03

Study Period

“Pre”

“Post”
Data Source & Study Groups

- Administrative DX of schizophrenia (T₀) per the National Psychosis Registry (SMITREC)

- Patient groups
  - Groups 1 & 2 = “Copay” (non-service connected 0-49%)
  - vs
  - Group 3 = “Exempt” (SC≥50%)

- Multivariable longitudinal random effects models
Primary Outcomes

- Pharmacy utilization (30-day fills)
  - total, medical, psychiatric

- Health Services Utilization
  - total psychiatric days & total outpatient visits

- Costs from VA perspective
  - total pharmacy
Results: Descriptive Statistics

- final sample = 80,668 ~ 50% “Exempt”
- overall means:
  - age = 52.8; women = 5.3%; minority = 36.8%; # of comorbidities = 1.97
- bivariate analysis: (baseline)
  - Groups 1 & 2 healthier, ↓utilization, less VA tenure
  - Group 2 somewhat distinct from non-SC Group
Medical Drug Fills (mean #)

- Group 1
- Group 2
- Group 3 (Exempt)

Copay increase
* among those patients with *any* admission
Discussion

- Hypotheses & Interpretation of Results
- Theoretical Context
  - Adherence / Utilization: Role of Health Beliefs
  - Equity Issues & VA mission
- VA cost savings, generalizability, limitations
- Copayment increase: “Success”? 
  - cost-effectiveness vs. mission vs. philosophy
  - other cost-sharing options?
- Veterans as vulnerable population
  - unique patients with schizophrenia
  - other complex medical or psychiatric conditions
Ethnicity, Copayments, and Differential Cost-Related Burdens

Zeber JE, Copeland LA, Miller AL, Kilbourne AM, Velligan DI. [abstract presented at 2008 ISPOR meeting, Toronto]
Sub-analysis and enhanced study design approach (4 ethnic groups, 22 time periods)

Findings: all groups restricted psychotropics as before (16-22%)

However, African-Americans and Hispanics experienced far greater ramifications (e.g., IP days, ER visits)

Summary: differential burden of medication cost, equity issues
A Cost-Benefit Analysis of Changing Pharmacy Benefit Policy

Zeber JE, Leykum L, Valenstein M, Copeland LA, Miller AL. [abstract to be presented at the 2009 HSRD meeting and 2011 Mental Health Economic Policy meeting, Venice, Italy]
Introduction & Objective

- little work done in mental health
- increasing HSR&D research into the adverse effect of medication copayments

* From the VA’s perspective, what are the cost-offset policy implications of ↑ copayments, balancing additional copayment revenue with extra treatment costs?
Methods

- all Copayment veterans with SCH in FY99 (N=33,431)
- Apr 1999 – Sept 2005 with 22 quarterly time points
- pharmacy fills, psychiatric IP and total ER utilization, along with **total costs**

<table>
<thead>
<tr>
<th>additional copayment revenue</th>
<th>+</th>
<th>vs.</th>
<th>↑ Inpatient and ER costs</th>
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<tbody>
<tr>
<td>cost-related ↓ psychotropic fills</td>
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Analysis:

- Microsoft Office™ statistical package & sophisticated program coding: + (“plus”, etc.), -, /, ... \( \Sigma \)
- primary analysis focused on POST-policy utilization & costs
  - $$ adjusted to 1999 medical CPI
- Sensitivity: ER $$ estimation, \Delta s attributable to policy \uparrow
Results

Cost-offset calculation:

- additional copay revenue: $15.62 million
- reduced psychotropic pharmacy costs: $2.94 million
- higher IP costs: $18.85 million
- higher ER costs: $1.83 million

TOTAL: $2.12 million

~$771,000 annualized loss
Discussion

- 2002 benefit $\Delta = \text{clinical & budgetary implications}$
- Current study reflects only 0.6% of all VA patients
- Study period does not include 2006 or future copayment increases
- Other economic or resource costs?
- Concerns about “silo mentality” in cost savings
Medication Adherence, Ethnicity, and Multiple Psychosocial & Financial Barriers in Veterans with Bipolar Disorder

subtitle: “A young(ish) researcher’s slow but inexorable journey towards self-realization”

Introduction

- Patients face multiple barriers to adherence, yet the cumulative effect and interaction often not examined

- **Psychosocial factors**: personal, environmental, & cultural context

- Burden of **financial barriers**: income, copayments

- Involves complex interactions across diverse population

- Certain individuals experience inequitable burdens of these barriers: elderly, multiple conditions, minorities
Psychosocial Barriers

- Diverse matrix of health beliefs, TX preferences & care-seeking, social or environmental support, perceptions
- Fortunately many interventions have proven successful:
  - cognitive behavioral therapy (low insight)
  - blister-paks (M Valenstein)
  - cognitive adaptive training (environmental instability)
  - family sessions or motivational therapy
  - patient-centered care / CCM
  - health benefit policies
Our prior work with this dataset & population:

- Therapeutic alliance ¹-³
- Medication Beliefs ⁴
- Access to care ⁵-⁶
- Complementary and Alternative Medicine (CAM) ⁷

**Objective**: Explore panoply of potential barriers, reconcile TX preferences, provider goals, ➔ design tailored interventions

Methods

All variables and survey data from CIVIC-MD study (PI – Kilbourne)

Large population-based study examining quality of care provided to veterans with bipolar disorder (N=435)

Self-reported measures of medication adherence and perceived barriers

Primary outcome: two definitions of adherence

- **Morisky** scale – intrapersonal barriers (2+ = non-adherence)
- No Missed Days, in past 4
Adherence Barriers

Financial
- Income (<$20,000)
- Ever restricted treatment due to cost
- Medication copayment (service connection <50%)

Psychosocial
- Difficulty accessing a mental health specialist
- Poor therapeutic alliance (HCCQ ≤ 25)
- Low medication insight (med-perspective ≤ 7)
- Binge drinking
- Live alone
- Travel 50+ miles to VA care

* Side effects? sadly not available …

[Zeber JE et al. (2010), Ann Pharmacother]
Analysis

Bivariate analysis examined association between the 9 barriers \(\rightarrow\) adherence; 5 selected for final models

Logistic regression predicted poor adherence

Covariates = ethnicity, age, some college, homeless, any affective symptoms

two separate models

1) adherence = total \# of barriers + covariates

2) adherence = barrier\(^1\) + ...barrier\(^5\) + covariates
Descriptive & Bivariate Results

Non-adherence rates:

- Morisky = 46%; No missed days = 27%
- mean # of barriers = 2.8; 20% experienced >4

Specific barriers (“yes”):

- low income = 58%; forego TX = 13%; copay = 59%
- access to specialist = 18%; poor alliance = 18%; low medication insight = 14%; binge drinking = 22%;
  live alone = 35%; >50+ to TX = 16%

Ethnic differences: low income, access to MH specialist, binge drinking
Multivariable Models

Model #1:
- OR=1.29 per Morisky barrier
- key covariates: affective symptoms (1.95), other race (2.25)

Model #2:
- insight (2.41), binge (1.95), specialist access (1.73)
- covariates = affective symptoms (1.76)

Ethnicity * barrier interaction models
Discussion

- Patients experience numerous barriers, with # and type associated with medication adherence problems
- Significant barriers include insight, substance abuse, and access, but also affective disorder symptoms
- Ethnic differences were observed here - more work needed to understand importance & interaction effects
- Financial barriers (e.g., copayments) not as significant
- Results support designing tailored interventions to improve adherence, recognizing patient-level burdens
Medication Adherence in Patients with Chronic Illnesses: The Role of Provider and Organizational Factors
**Project(s) Summary**

- Chronic Care Model → A1c / CAD risk (Parchman – PI)
  - NIH / NIDDK Grants #R34 DK067300 and R18 DK075692

- Pilot study (5 clinics) and larger project (40 clinics)

- Goal: facilitate delivery of diabetes care to improve intermediate clinical outcomes

- Education efforts directly targeting outcomes often less successful

- However, elements of the Chronic Care Model (CCM) offers potential benefits
ABCs: a conceptual model

Facilitation efforts & "Toolkit" of Strategies

Leadership

Communication

Learning

Implementation of CCM / PCMH

↑ Activation / Self-engagement

↑ Medication Adherence

Improved A1c control and other clinical outcomes
ABCs Pilot Study (n=157, 5 clinics)

Risk of Coronary Artery Disease in Type 2 Diabetes and the Delivery of Care Consistent With the Chronic Care Model in Primary Care Settings

Parchman ML, JE Zeber, Romero R, Pugh JA (2007), Medical Care, 45(12):1129-34

Participatory Decision Making, Patient Activation, Medication Adherence, and Intermediate Clinical Outcomes in Type 2 Diabetes

Objective: Examine association between dimensions of the therapeutic alliance, perceived drug costs, and medication adherence.
Measures:

- patient engagement / self-activation (Lorig); physician level of patient-centered care (Kaplan); cost-related medication restrictions (Piette)

Main Outcome / Analysis: medication adherence (Morisky) with structural equation model

Results:

- SEM model: direct inverse relationship between cost burden → adherence; patient-centeredness associated with self-activation, which then positively influenced medication adherence; self-activation mediated cost issues

Efforts to improve the therapeutic alliance can improve adherence & clinical outcomes
Perceived Drug Costs

Adherence (baseline)

Self-Activation (patient)

Medication Adherence (follow-up)

Patient Demographics (age, gender, education, income)

Patient Centeredness (of provider)

Adherence (baseline) → Self-Activation (patient) p=.001

Perceived Drug Costs → Self-Activation (patient) p=.01

Patient Demographics (age, gender, education, income) → Medication Adherence (follow-up) p=.001

Medication Adherence (follow-up) → Patient Centeredness (of provider) p=.02
Numerous projects, including a couple on adherence

“Impact of the chronic care model on medication adherence when patients perceive cost as a barrier”

Mackey K, Parchman MP, Leykum LK, Lanham HJ, Noel PH, Zeber JE. in press, Primary Care Diabetes

- 40 clinics, n = 1,823 with a chronic health condition
- nested random effects models
- patient perceptions of chronic care delivery associated with cost-related adherence problems
- patients with intermediate adherence befitted most from ↑ CCM
Cost-Related Medication Adherence and Patients’ Experience with the Chronic Care Model

“The communication and coordination of scattered fragments of knowledge is perhaps the basic problem of any society.” - Thomas Sowell

Zeber JE et al. [abstract presented at 2010 Academy Health meeting; manuscript in preparation]
Objectives / Methods

Aims:

1) Examine association between patients’ experience of the CCM and reported cost-related adherence burden

**ABCs project:** Foster CCM / PCMH implementation in small community clinics and ↓ risk factors for diabetes complications

**A = A1c**    **B = Blood pressure**    **C = Cholesterol**
Population Studied: Patients with chronic medical illness at 40 primary care offices in South Texas

Initial intervention group (20) and delayed control group (20)

Complex study: observations, facilitation sessions, provider and staff interviews, patient surveys, chart reviews, dissemination

For this study, we utilized patient survey data only (n=60 per clinic)

Measures & Analysis:

- Cost-related adherence burden (CRAB) was measured with a 5-item scale, higher scores reflect more medication restrictions
- Patient Assessment of Chronic Illness Care (PACIC) - 20-item instrument assessing perceptions of primary care treatment; higher values = care more consistent with CCM
- Random effects models controlled patient nesting, demographics
Results

To date, 1368 patients completed baseline surveys

Patient characteristics: age = 50.1 years; 65% women, ~50% Hispanic; overall self-reported health status good

poor adherence = 45% and ~30% with cost-related problems

CRAB mean =1.50 (sd 0.8), total PACIC mean = 3.02 (sd 1.2)

Multivariable models

- CRAB was inversely associated with total PACIC score (OR = 1.17)

also, higher subscales scores for:

- patient activation (OR = 1.28), problem solving (OR = 1.16), and practice design (OR = 1.26)
Figure 1: Multivariable Model Predicting No CRAB

Odds Ratio (OR) – per point change in PACIC score

* models controlled for age, gender, ethnicity, and education
Discussion

- Patients experiencing care more consistent with the CCM had lower cost-related burden

- Being actively involved in clinical decisions and provided information about their care → added benefits

- ** Efforts to develop highly activated, involved patients can help mitigate ramifications of financial pressures

- Community providers should better recognize and discuss medication cost burdens while focusing efforts in accordance with chronic care treatment delivery
Other Thoughts and Next Directions

- adherence interventions are often **not** cost effective
- however, room for optimism and CCM efforts fit nicely into VA patient-centered goals (PACT)

Next steps:
- HSRD 2012 meeting abstract (adherence instability)
- sub-group analysis re: CCM effects
- merit grant of modern technologies (cell phones)
- data from Learn & Relate study (J Pugh – PI)
- potential use of HMORN data for cross-system analysis
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